

Washington State Department of Ecology

An Environmental Management System Alternative to Pollution Prevention Planning

Introduction to EMS – Part II October 16, 2012

2012 -2013 Webinar Series Partners:
National Pollution Prevention Roundtable
Stewardship Action Council
The Auditing Roundtable



2012 -2013 Webinar Series Overview

- **Introduction to EMS – National Pollution Prevention Roundtable**
September 25, 2012
 - Introduction to Ecology's EMS Program
 - EMS Overview
 - ISO14001 Gap Analysis Tool
- **Introduction to EMS – Part 2 National Pollution Prevention Roundtable**
October 16, 2012
 - Ecology's EMS Program
 - Toxics Reduction Overview
 - Objectives & targets



2012 -2013 Webinar Series Overview

- **EMS Implementation Part I – Stewardship Action Council
(November 5, 2012)**
 - Monitoring & Measurement
 - Communications & Engagement
- **EMS Implementation Part II – Stewardship Action Council
(December 4, 2012)**
 - Monitoring & Measurement
 - Communications & Engagement
 - Ecology EMS Guidance



2012 -2013 Webinar Series Overview

- **EMS Auditing Session I - The Auditing Roundtable (January/February 2013)**
 - Preparing for and Conducting EMS Audits
 - Understanding EMS Auditing
 - EMS Auditor Qualifications
 - Pre-Audit Planning & Preparation
 - Conducting the EMS Audit
 - Ecology EMS Guidance
- **EMS Auditing Session II - The Auditing Roundtable (March/April 2013)**
 - Audit Reporting, Evaluations and Management Review



Ecology EMS Alternative

- Provides flexible approach to P2 planning.
- Meets RCW 70.95C; Chapter 173-307 WAC requirements
- Work with Ecology to demonstrate operating EMS is in place.



EMS Alternative Process

- Work with regional Ecology staff at earliest opportunity.
- Submit request describing how EMS meets P2 planning criteria.
- Submit EMS documentation for regional staff review & collaboration.



EMS Alternative Process

- Host an Ecology EMS Site Visit.
- Conduct Facility Periodic Assessment (at least once every five years – 3 years recommended).
- Submit annual progress report via TurboPlan or e-mail supporting materials to regional staff.



Ecology's Pollution Prevention Criteria

2.1 Pollution Prevention Policy

2.2 Implementation

2.3 Monitoring & Measurement



DRAFT

DRAFT 10/12/2012 FACILITY SELF-ASSESSMENT CHECKLIST – ECOLOGY's EMS ALTERNATIVE

Facility Name: _____ EMS Facility Website (if available): _____

Facility ID#: _____ Region: _____

Additional EMS Facilities covered under Corporate EMS: _____

EMS Team Lead: _____ E-mail: _____ Date: _____

Ecology Regional Contact: _____

Facilities should refer to the Ecology EMS guidance document during review, as element descriptions are paraphrased on this checklist.

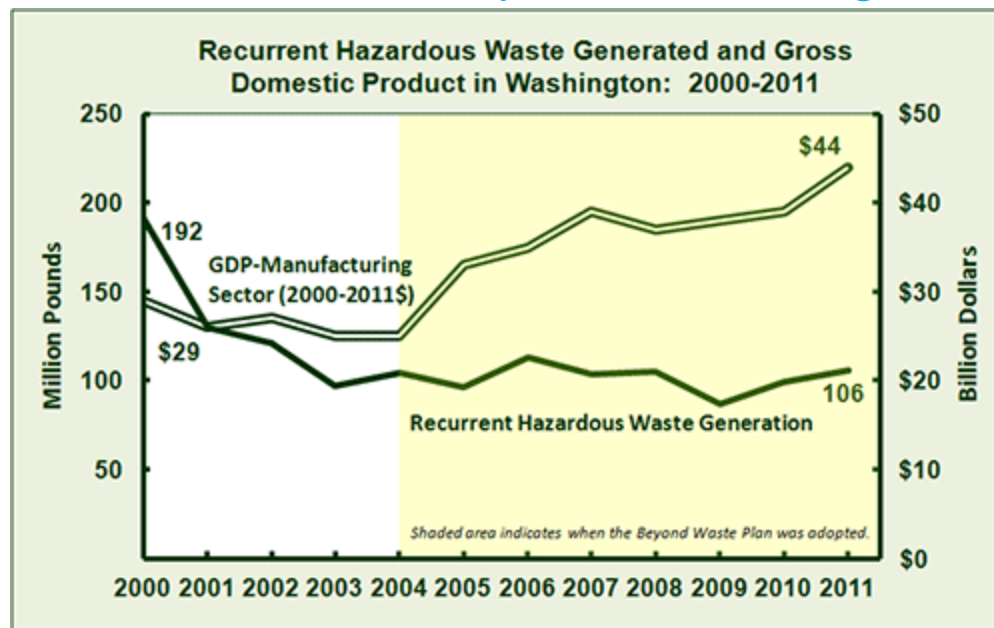
Element	EMS Reference document/ page	Included in EMS Documents?	Addressed in Periodic Self-Assessment	Reviewed during Ecology Site Visit	Comments
1.2 Facility Description Name, industry type, products/services.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.1 POLICIES					
2.1.1 Policy components					
a) Establishes P2 as preferred approach.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) HW recycled or treated if not amenable to P2.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Available to public.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Communicated to employees.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Management commitment to implement policies and periodically evaluate EMS.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.1.2 Continual Improvement Adopts policies and procedures which ensure ongoing identification and evaluation (technical and economic) of P2 opportunities in decisions having environmental consequences.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



Element	Reference document/ page	Included in EMS Documents?	Addressed in Periodic Self-Assessment	Reviewed during Ecology Site Visit	Comments
2.2 IMPLEMENTATION					
2.2.1 Objectives and Targets Establishes and maintains objectives and targets consistent with P2 policies, including milestones and timeframes for implementation. Include objectives for: <ul style="list-style-type: none"> a) Hazardous Substances b) Hazardous Waste c) Other: _____ d) Other: _____ e) Other: _____ 		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.2.2 Roles and Responsibilities Defines responsibilities, resources and timeframes for implementing objectives.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.2.3 Employee Training Provides for employee training, awareness and involvement in identification and implementation of P2 opportunities.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.3 MONITORING & MEASUREMENT					
2.3.1 Periodic Assessment Commitment to conduct a periodic assessment, available to Ecology, of EMS elements, specifically P2 criteria.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date of Assessment:
2.3.2 Annual Performance Report Commitment to prepare and submit annual pollution prevention performance report, which includes description of progress in meeting objectives.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Hazardous Waste

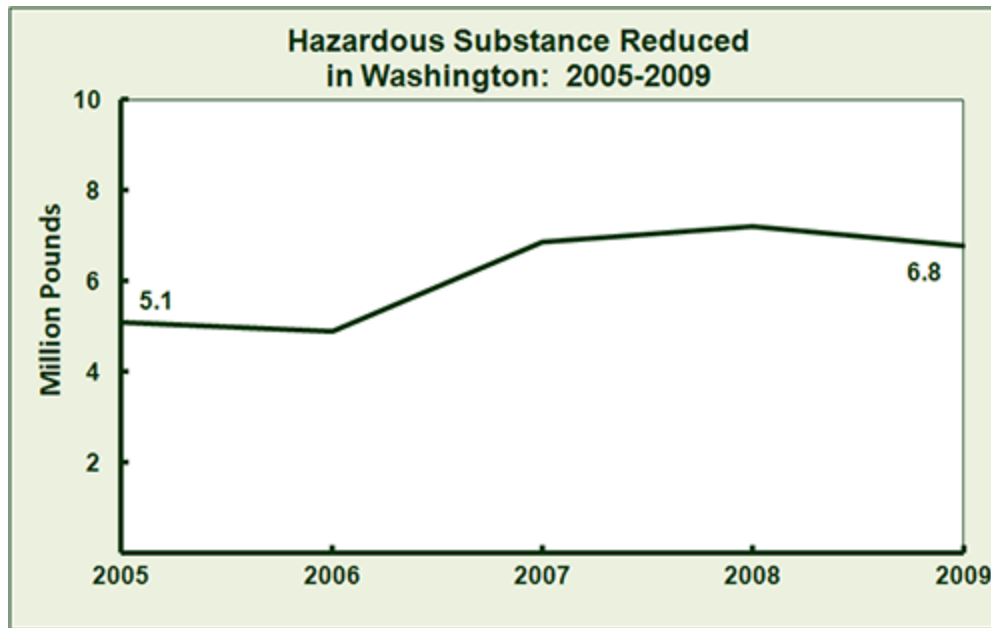
WA businesses created 64 percent less hazardous waste in 2011 than in 2000 for every manufacturing dollar produced.



http://www.ecy.wa.gov/beyondwaste/data_tables/hwGDPData2.xls

Hazardous Substances

30 million pounds reduced since 2005



http://www.ecy.wa.gov/beyondwaste/data_tables/indHazSubRedData.xls

Toxics Reduction Elements

- Toxics Metals Prevention (Mercury, Lead, Cadmium)
- ISO 14001 Chemicals Policy
- Safer Chemistry Challenge
- Alternatives Assessments
- Green Chemistry
- Ecology Technical Assistance



Product Regulation Trends

Polybrominated diphenyl ethers (PBDEs) are flame retardant chemicals.



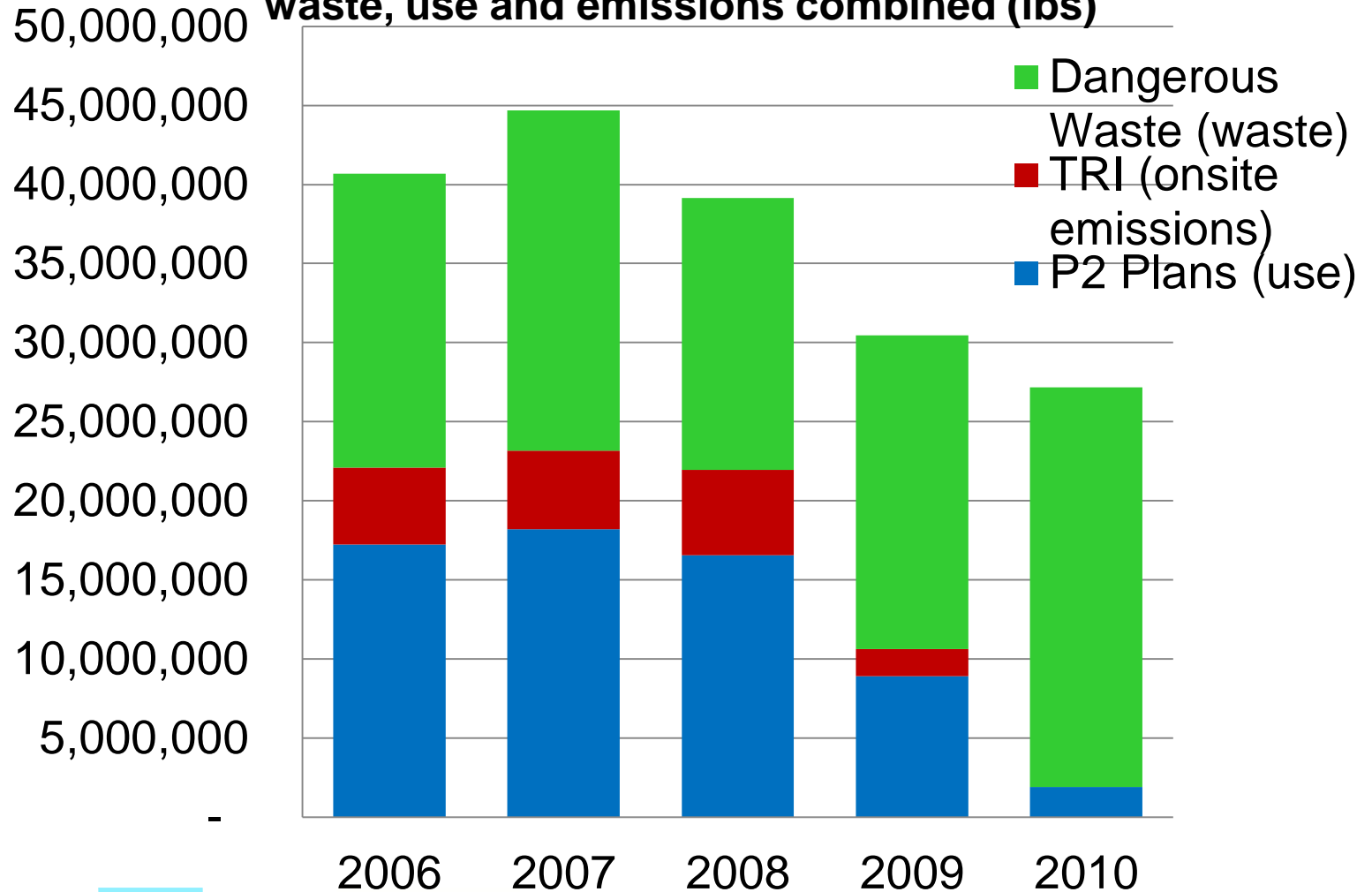
Deca-BDE is prohibited in TVs, and residential upholstered furniture.



Sports bottles that contain Bisphenol A (BPA) cannot be manufactured, distributed, or sold in Washington State. Bottles, cups, and other containers for children three years of age or younger were banned in July 2011.



Toxic Metals Prevention: Total lead, cadmium, mercury waste, use and emissions combined (lbs)



Chemicals Policy ISO 14001

ISO 14001 Chemicals Policy

The demand for environmentally responsible and relevant building products is growing rapidly. Building owners, Architects, contractors and building occupants want products made with chemicals that have low to no toxicity and which at the end of the product lifecycle are used to create new products and/or materials.

As we daily seek to fulfill our Corporate Mission to become a "World Leader of quality specialty building products and services", following our vision, "Creating products that make buildings better", we herein subscribe to these four primary guiding principles as the foundation of our Chemicals Policy.

1. **Know and disclose product chemistry.** We will identify the substances associated with and used in our products across their lifecycle and will increase as appropriate the transparency of the chemical constituents of our products, including public disclosure of chemicals of high concern and 3rd-party certification(s). Please note that substances deemed confidential will not be identified or disclosed to the public.
2. **Assess and avoid hazards.** We will determine the hazard characteristics of chemical constituents and formulations in our products, use chemicals with inherently low hazard potential, prioritize chemicals of high concern for elimination, minimize exposure when hazards cannot be prevented, and redesign products and processes to avoid the use and generation of hazardous chemicals.
3. **Commit to continuous improvement.** We will establish operational governance structures; policies and practices that create a framework for the regular review of product and process chemistry, and that promote the use of chemicals, processes, and the redesign/creation of products with inherently lower hazard potential.
4. **Support public policies and industry standards that:** advance the implementation of the above three principles, ensure that comprehensive hazard data are available for chemicals on the market, take action to eliminate or reduce known hazards and promote a greener economy, including support for green chemistry research and education.

The above four principles shall be managed and acted upon within our ISO 14001 structure and audited accordingly for ongoing compliance.

C/S reserves the right to disclose, or not disclose, its Confidential Business Information. It is the intent of this Chemicals Policy that products requiring CBI protection be vetted by our 3rd Party Certification consultant to ensure alignment with this Policy. 3rd Party Certifications may be made available upon written request.

Implementation will occur over a period of time.

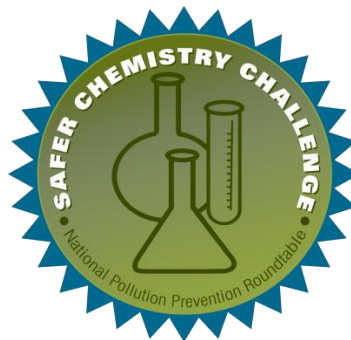


The Safer Chemistry Challenge Program

Voluntary program to recognize facilities that reduce the use of toxic chemicals of concern to human health and the environment.

- 10% by 2015
- 20% by 2020
- 25% by 2025

Baseline year of 2010



www.p2.org/category/challenge/



Alternatives Assessment

Alternatives Assessment: a process for identifying and comparing potential chemical and non-chemical alternatives that can be used as substitutes to replace chemicals or technologies of high concern.

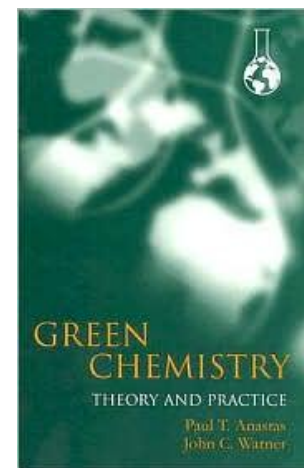
Source: Dr. Ken Geiser, Professor of Work Environment and Director of the Lowell Center for Sustainable Production at the University of Massachusetts Lowell



Green Chemistry

“Green chemistry is the utilization of a set of principles that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products.”

- Paul Anastas and John Warner, *Green Chemistry: Theory and Practice*, 1998





Introduction to EMS Webinar (Part II)

October 16, 2012

Sponsored by WA
Department of Ecology

Jeffrey Burke
National Pollution Prevention Roundtable





17 Steps of an EMS

■ Plan

- **Environmental Policy** - Develop a statement of the organization's commitment to the environment; use policy as a framework for planning and action.
- **Environmental Aspects and Impacts** - Identify environmental attributes of products, activities and services and their effects on the environment.
- **Legal and Other Requirements** - Identify and ensure access to relevant laws and regulations.
- **Objectives and Targets** - Set environmental goals for the organization .



17 Steps of an EMS

- **Do**

- **Environmental Management Program** - Plan actions to achieve objectives and targets.
- **Structure and Responsibility** - Establish roles and responsibilities within the organization; identify needed resources.
- **Training, Awareness and Competence** - Ensure that employees are aware of and able to perform their environmental responsibilities.
- **Communication** - Develop processes for internal and external communication on environmental management issues.



17 Steps of an EMS

■ Do

- **EMS Documentation** - Maintain information about the EMS and related documents.
- **Document Control** - Ensure effective management of procedures and other documents.
- **Operational Control** - Identify, plan, and manage the organization's operations and activities in line with the policy, objectives, and targets.
- **Emergency Preparedness and Response** - Develop procedures for preventing and responding to potential emergencies.



17 Steps of an EMS

■ Check

- **Monitoring and Measuring** - Monitor key activities and track performance; conduct periodic assessments of compliance with legal requirements.
- **Nonconformance and Corrective and Preventative Action** - Identify and correct problems and prevent recurrences.
- **Records** - Keep adequate records of EMS performance.
- **EMS Audit** - Periodically verify that the EMS is effective and achieving objectives and targets.



17 Steps of an EMS

- **Act**

- Management Review - Review the EMS with an eye to continuous improvement.



Environmental Policy

ISO 14001 Requirement

- Top management shall define the organization's environmental policy and ensure that ... it:
 - Is appropriate to the nature, scale and impacts of its activities, products and services;
 - Includes a commitment to continual improvement and prevention of pollution;
 - ... commitment to comply with applicable legal requirements and other requirements to which the organizations subscribes
 - Provides the framework for setting and reviewing environmental objectives and targets



Boeing

<http://www.boeing.com/aboutus/environment>

- Boeing is committed to:
 - Conducting operations in compliance with applicable environmental laws, regulations and Boeing policies and procedures;
 - Preventing pollution ...
 - Continually improving (their) EMS
 - Working together with stakeholders on activities that promote environmental protection and stewardship



IBM

<http://www.ibm.com/ibm/environment/policy/>

- Environmental Affairs Policy

- A commitment to leadership built upon respect

- 12 points

- “Every employee and every contractor on IBM premises is expected to follow this policy and to report any environmental, health, or safety concern to IBM management. Managers are expected to take prompt action”

USA EPA Region 3

www.epa.gov/region03/ems

- Environmental Management Policy
 - It is the policy of EPA's Philadelphia regional office to manage our organization and programs in a manner that protects the environment, the safety of our employees, and public health.
 - 9 points
 - Signed by all senior managers



Environmental Aspects

- The organization shall establish, implement and maintain a procedure(s):
 - Identify the environmental aspects of its activities, products and services (control and influence)
 - Determine those aspects that have significant impacts on the environment
- The organization shall ensure that the significant environmental aspects are taken into account in establishing, implementing and maintaining its EMS



Environmental Aspects

- List all of Your Activities, Products and Services (spreadsheet)
 - List sub-activities to identify all the steps in a process or sub-process
 - Identify inputs and outputs to each step

Sample List of Aspects and Impacts

Aspects:	Potential Impacts:
Air Emissions	Increased air pollution Decreased air pollution Elimination of air pollution Reduced Visibility
Energy Usage	Depletion of natural resources Conservation of natural resources
Natural Resource Usage	Depletion of natural resources Conservation of natural resources Degradation of water quality Enhancement of water quality Disturbance of habitats Enhancement of habitats
Solid Waste Generation -or- Hazardous Waste Generation	Increased landfill loading Decreased landfill loading Increased air pollution Decreased air pollution Increased soil contamination Decreased soil contamination Increased surface water contamination Decreased surface water contamination Increased groundwater contamination Decreased groundwater contamination Depletion of natural resources Conservation of natural resources
Recycling -or- Reuse	Decreased landfill loading Conservation of natural resources

From KPPC

Activities, Products and Services Aspects and Impacts

Facility:			
Division:			
Units:			
Process:			
Activity	Subactivities	Aspects	Actual and potential impacts
Storage Feedwater			Landfill space
		Use of compressed air (diesel)	Air pollution
			Depletion of non-renewable natural resources (water-instead of using for treatment, putting excess water into oil wells)
	Maintain water level	Discharge of water	Depletion of non-renewable natural resources (water-instead of using for treatment, putting excess water into oil wells)
	Maintenance of storage tank: Sandblasting	Generation of spent blasting material	Water pollution
		Generation of spent blasting material and paint	
	Maintenance of storage tank: Chemical cleaning	Generation of spent solvents	Air pollution
		Spills of solvent	Water pollution
		Generation of solvent-contaminated rags	Landfill space
	Maintenance of storage tank: Coating	Use of solvents, thinners	Air pollution
		Use of paints (VOCs, metals)	Air pollution
		Generation of paint-contaminated rags,	Landfill space
	Water sampling	Use of glass sample containers	Landfill space
	Skimmer		Employee exposure
Pumps (Return condensate, RO makeup, Extra steam from fin fans)	Pump operation	Discharge of water to TPS	Depletion of non-renewable resource
		Use of corrosion cables	Landfill space
		Failure to detect leaks	Air pollution
	Pump maintenance		Employee exposure
		Use of electricity	Non-renewable resources (natural gas)
		Use of solvents, cleaners	Air pollution (VOCs)
		Generation of solvent-contaminated rags	Hazardous waste
Dearator feed pumps (motor-driven)	Lubrication	Spills of solvent	Groundwater contamination
		Use of oil	Non-renewable resources (petroleum)
		Spills of oil	Groundwater contamination
	Preventive maintenance		
		Use of solvents, cleaners	Air pollution (VOCs)
		Generation of solvent-contaminated rags	Hazardous waste
Maintenance, when problems are identified		Spills of solvent	Groundwater contamination

Significance Determination Rating Scales

Frequency or likelihood (F) scale	
5 = Continuous	-ongoing or daily.
4 = Frequent	-more than once per month.
3 = Infrequent	-more than once per year, less than once per month
2 = Rare	-impact may occur once every year or two
1 = Never	-never occurred or highly unlikely

Environmental impact severity (E) scale	
5 = Severe	-immediate threat likely to result in widespread damage to human health or the environment; requires great effort to remediate or correct.
4 = Serious	-no immediate health threat, but significantly damages the environment; difficult but possible to remediate
3 = Moderate	-somewhat harmful, but correctable.
2 = Mild	-small potential for harm to environment, correctable.
1 = Insignificant	-trivial consequences, easily correctable or not impact.

Mission impact severity (M) scale	
5 = Loss of ability to accomplish critical mission or near mission failure.	
4 = Severely degraded mission capability or serious mission restrictions.	
3 = Moderate mission restrictions.	
2 = Minor mission impacts or restrictions.	
1 = Insignificant mission impacts or restrictions; alternative courses of action are available.	
0 = No mission impacts or restrictions.	

Regulatory impact (R) scale	
5 = Regulated - noncompliance condition; actual or possible enforcement action or NOV.	
4 = Regulated - generally in compliance, but not completely controlled or managed; some risk of noncompliance in future, or under scrutiny by regulators.	
3 = Regulated - in compliance, well controlled or managed; little regulator interest.	
2 = Likely to be regulated in future by federal, state, or host nation agency.	
1 = Best management practice (BMP) applies.	
0 = No requirements apply.	

Community concern (C) scale	
4 = Public outcry or lawsuits.	
3 = Serious community concern, political or activist inquiries, intense negative media.	
2 = Moderate community concern, some media coverage.	
1 = Community is not currently concerned, but could become so.	
0 = Community is ambivalent or unconcerned.	

From KPPC

Rating Aspect Significance (EPA Region 3)



■ Environmental Significance (1-5)

- Scale of impacts (how big)
- Severity of impact (how bad)
- Probability of occurrence (how likely)
- Duration of impact (how long)

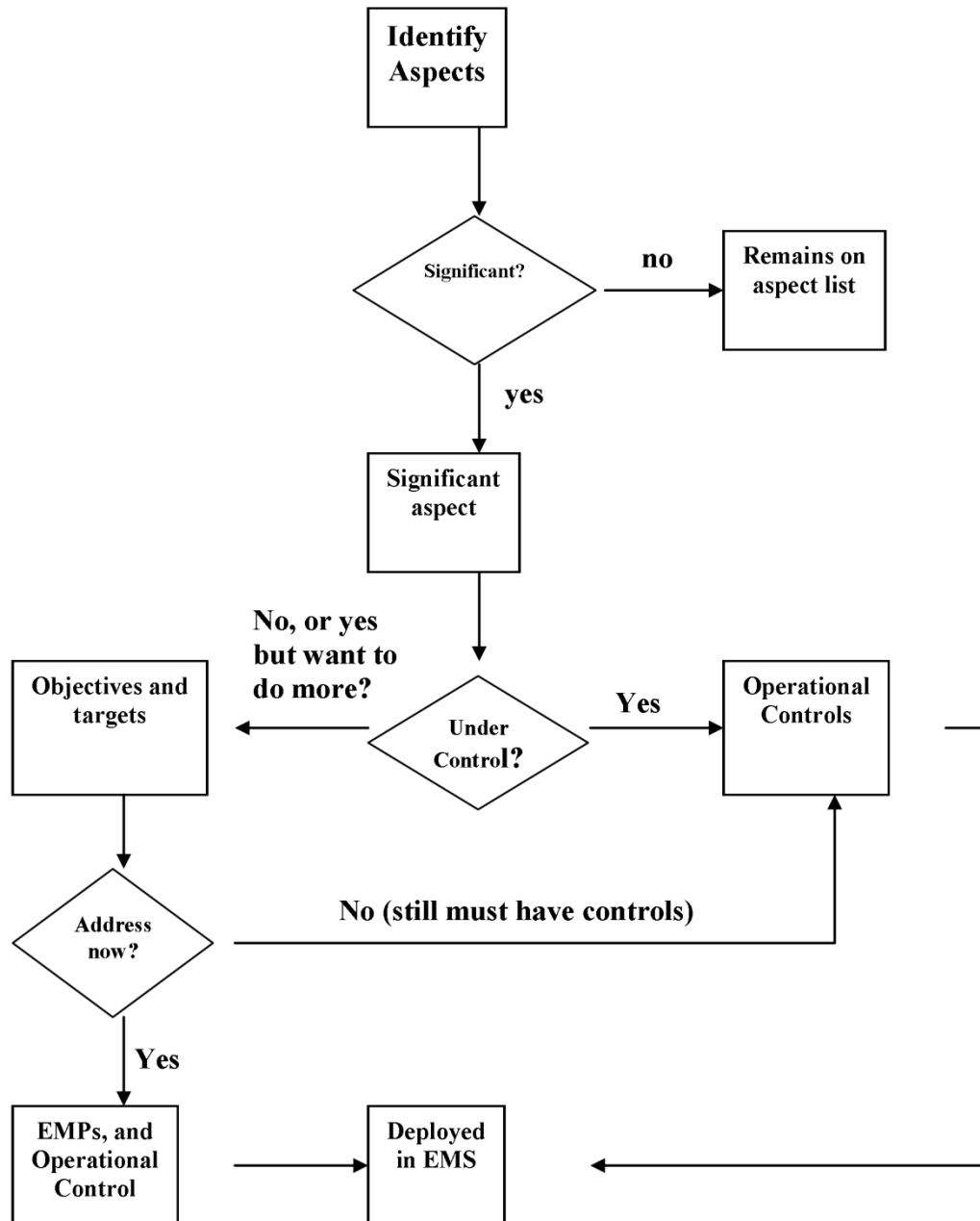
■ Business Significance (1-5)

- Potential regulatory and legal exposure (risk)
- Ease of changing the impact (can we stop it)
- Concerns of public or effect on image (does the public care about this)
- Minimal change of process (do we control it)

Frequency	Definition
5	Very common and happens often within our organization (daily - once a week)
4	Known to have regularly occurred within our organization (bimonthly- quarterly)
3	Rarely occurs within our organization (annually - once every few years)
2	Known to occur within the industry or within other similar organizations
1	Unknown to occur and would be extremely unlikely or impossible

Severity	Impact	Definition
5	Human Health	Immediate terminal illness or fatality
	Ecological Health	Long term damage to surrounding eco system, requires major corrective action loss of an endangered species, widespread or prolonged loss of flora and fauna
	Natural Resources	Depletion of nonrenewable natural resource exceeding design averages by over 40% Depletion of a renewable resource by over 60% of design averages
	Public Image	International public or media attention with potentially restrictive impact
4	Human Health	Immediate long term treatable illness or delayed terminal illness or fatal
	Ecological Health	Long term damage to surrounding eco system, requires major corrective action harm to an endangered species, widespread or long term harm and some loss of flora and
	Natural Resources	Depletion of nonrenewable natural resources exceeding design averages by over 20% Depletion of a renewable resource by over 40% of design averages
	Public Image	National public or media attention with potentially restrictive impact
3	Human Health	Immediate short term illness or delayed long term treatable illness
	Ecological Health	Short term damage to surrounding eco system, requires minor corrective action Major or prolonged harm to flora and fauna
	Natural Resources	Depletion of non renewable natural resource exceeding 5% of design averages Depletion of a renewable resource by over 20% of design averages
	Public Image	Regional public or media attention causing considerable impact
2	Human Health	Immediate minor irritation or discomfort or delayed short term illness
	Ecological Health	Short term damage to surrounding ecosystem, requires no corrective action Short term harm to flora and fauna, requires no corrective action
	Natural Resources	Depletion of nonrenewable natural resource within 5% of design averages Depletion of a renewable resource over 5% of design averages
	Public Image	Slight impact on public, no public concern; public or media awareness may exist
1	Human Health	No effect on human health
	Ecological Health	no effect on surrounding ecosystem No loss or harm to flora and fauna
	Natural Resources	Depletion of nonrenewable natural resource below design average by more than 5%, Depletion of a renewable resource within +/- 5% of design averages
	Public Image	No impact on public; no public concern

Aspects Planning Process



From KPPC



Objectives and Targets

- The organization shall establish, implement and maintain documented environmental objectives and targets
 - Objective – overall environmental goal
 - Example – Prevent releases to the air
 - Target – detailed performance requirement
 - Example - Zero air releases by 2014



Starbucks

<http://www.starbucks.com/responsibility/environment>

- Objective: Building Greener Stores
- Target: Building all of our new company-owned stores to LEED® Certification standards.
 - Allows us to track our progress against industry-wide baselines and continue to reduce our overall environmental footprint



Environmental Management Programs

- The organization shall establish, implement and maintain a program for achieving its objectives and targets
 - Designation for responsibility for achieving objectives and targets at relevant functions and levels of the organization
 - The means and time-frame by which they are to be achieved

EMS Action Plan for: Fugitive Gas Emissions

Objective: Prevent Fugitive gas emissions

Targets: Zero fugitive emissions in two years

4

Activity	Responsible Party	Timeframe	Resources	Comments
Implement fugitive air emissions detection program which includes defining potential sources (gas only)(such as flanges, valves, connections) sampling frequency, detection limits, tagging, maintenance when fugitive air emissions are detected.	Inspections	2 years	Purchase of additional "sniffers"	Check on availability of ATX-612
Preventive maintenance programs include fugitive emission sources	Maintenance Unit	1 year		Verify that existing PM program is preventing fugitive emissions
Training in use of "sniffers" for Environmental Coordinators and Operations	Inspections	1 year		

Waste and Purchasing	1/7/2009		
EPA Mid-Atlantic Region 3 Environmental Management System			
The waste and purchasing work group is responsible for developing and implementing the work plan to achieve the targets outlined			
Objectives			
Reduce Paper Use			
Reduce Solid, Chemical and Electronic Waste			
Increase the Purchase of Green Products			
Agencywide Targets			
Baseline post consumer (PC) content of paper			
100% of paper is 50% post consumer content			
Baseline number duplex capable, printers, copiers, etc.			
Verify the 39.9% 2006 baseline agency solid waste diversion rate			
Determine targets and metrics to achieve a 45% waste diversion rate by 2010			
All 26 reporting facilities will have registered to be an FEC partner			
Develop and implement the Agency Action Plan for meeting Electronic Stewardship goals			
Establish baseline of all equipment using ODS and management plans for same			
Verify compliance with Agency Affirmative Procurement program			
Where available, 95% of electronic product purchases are EPEAT			
Metric	Responsibility	Time Frame	Resources
% of post-consumer content in each paper used in our office	Joseph Jackson, Facilities Management and Services Branch	monthly	Hours
% of our paper purchases that have 50% or greater PC content	Brian Kovak, Environmental Management Systems Coordinator (3PM20)	annually	Hours
% and # of default duplex printers, copiers etc. in our office	Joseph Smith, Chief, Facilities Management Services Branch (3PM20)	annually	Hours
% of solid waste diverted for recycling and reuse in our office	Joseph Smith, Chief, Facilities Management Services Branch (3PM20)	annually	Hours
# of commodities managed by waste reduction or recycling controls	Geoff Fala, Chief, Computer Services Branch (3PM80)	annually	Hours

Elements of an Environmental Management Systems (EMS)





Questions?

- Thank You For Your Participation